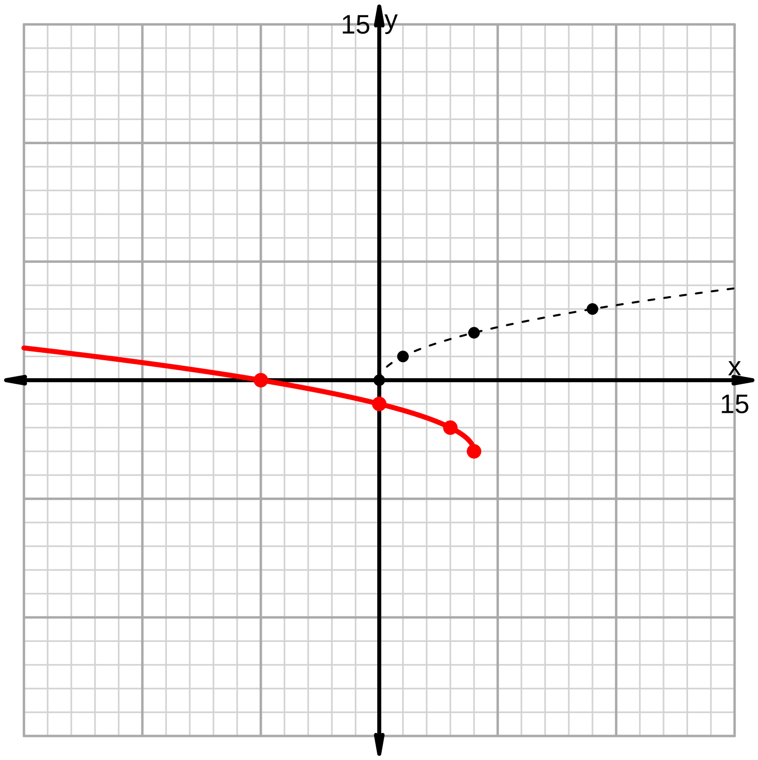
Name: Date:

u10 Radicals, Rationals, and Extraneous Solutions Practice (version 1)

1. Below I've graphed with a dotted curve $y = \sqrt{x}$ with some key points marked with dots. Please draw a graph for $f(x) = \sqrt{-(x-4)} - 3$, paying close attention to the corresponding key points.



2. State the domain of $y = f(x)$

You can use $x \leq 4$ or $(-\infty, 4]$ to state the domain.

3. State the range of $y = f(x)$

You can use $y \geq -3$ or $[-3, \infty)$ to state the range.

4. Find all **extraneous** solutions and **actual** solutions to $\sqrt{-(x-4)} - 3 = x - 7$

$$\sqrt{-(x-4)} - 3 = x - 7$$

$$\sqrt{-x+4} = x - 4$$

$$-x + 4 = x^2 - 8x + 16$$

$$0 = x^2 - 7x + 12$$

$$0 = (x-3)(x-4)$$

So, the possible solutions are $x = 3$ and $x = 4$.
Plug each possible solution into the original equation to check.

Check whether $x = 3$ makes equation true.

$$\sqrt{-((3)-4)} - 3 \stackrel{?}{=} (3) - 7$$

$$-2 \neq -4$$

Check whether $x = 4$ makes equation true.

$$\sqrt{-((4)-4)} - 3 \stackrel{?}{=} (4) - 7$$

$$-3 = -3$$

- Actual solution: $x = 4$
- Extraneous solution: $x = 3$

I should say that there is also a graphical approach possible for this problem. If you use it, please explain.

u10 Radicals, Rationals, and Extraneous Solutions Practice (version 1)

5. Determine the locations of the x-intercept, the removable discontinuity (the hole), and the y-intercept. Based on those features, sketch the rational function.

$$f(x) = \frac{x^2 - 3x - 10}{x^2 + 3x + 2}$$

feature	x coord	y coord
x-intercept		
y-intercept		
hole		
vertical asymptote